# Thermophysical Property Measurements of Submicrometer Thin Films Using a Picosecond Thermoreflectance Technique

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A “rear heating / front probing” type (RF-type) picosecond thermoreflectance measurement system, which has the same configuration as the macroscopic laser flash method for bulk specimens, has been developed in the National Research Laboratory of Metrology. In this configuration, thermal energy transfer across metal thin films deposited on transparent substrates can be observed directly. The validity of Fourier's law was experimentally confirmed for thermal diffusion to a length of 100 nm within 100 ps at room temperature. Thermal diffusivity values of typical metal thin films were measured by this RF picosecond thermoreflectance method with much smaller uncertainty than the conventional “front heating / front probing” type (FF-type) thermoreflectance method.